Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently amended) Apparatus for electroporation comprising a wave generator, a biochip containing an array of microelectrodes and a control system that permits ~~to~~ transfer ~~the~~ of a signal to a pre-selected single microelectrode of the biochip.

2. (Currently amended) Apparatus according to claim 1 ~~characterised in that~~ wherein the control system consists of a personal computer equipped with a software program capable of designing various waveform signals and a switching system controlling the wave generator output.

3. (Currently amended) Apparatus according to claims 1 ~~and 2 characterised in that~~ wherein the biochip comprises an array of microelectrodes of a size comparable to a ~~the~~ cell to be electroporated and each of said microelectrodes being driven separately from the others allowing very precise and punctual control of the electroporation process.

4. (Currently amended) A biochip ~~Biochip~~ comprising an array of individually driven microelectrodes ~~(20)~~ comprised on a suitable insulating layer mounted on a solid substrate; means to electrically connect said microelectrodes to a switching system; a cell culture chamber where ~~the~~ cells can be grown and adhere in contact with said array of microelectrodes on a surface formed by said insulating layer containing said array of microelectrodes on said solid substrate.

5. (Currently amended) The biochip ~~Biochip~~ according to claim 4 comprising a semiconductor substrate as the solid substrate covered with an insulating layer ~~(27)~~ comprising said array of individually driven microelectrodes ~~(20)~~ of a size comparable to the cell to be electroporated, and mounting a cell culture chamber ~~(24)~~ with an opening ~~(26)~~ mounted, in turn, on a support ~~(21)~~ made of dielectric

material, said microelectrodes ~~(20)~~ being electrically connected via conductive traces ~~(28)~~ to conductive pads ~~(29)~~ electrically connected, in turn, to a couple of external parallel connectors ~~(22)~~ through wire bonding ~~(23)~~ covered by an ~~the~~ outer portion of the cell culture chamber ~~(24)~~ encircling the opening ~~(26)~~, being said cell culture chamber ~~(24)~~ with the opening ~~(26)~~ mounted over the top of ~~the~~ said semiconductor substrate covered with the ~~an~~ insulating layer ~~(27)~~, both attached on the dielectric support ~~(21)~~.

6. (Currently amended) A biochip ~~Biochip~~ according to claim 5 comprising two further electrodes ~~(25)~~ integrated in the semiconductor substrate covered with the ~~an~~ insulating layer ~~(27)~~, and acting as a ground reference.

7. (Currently amended) A biochip ~~Biochip~~ according to claim 5 wherein the semiconductor substrate covered with the ~~an~~ insulating layer ~~(27)~~ is a silicon substrate covered with an ~~a~~ insulating layer preferentially of SiO_2.

8. (Currently amended) The biochip ~~Biochip~~ according to claim 5 wherein the ~~these~~ solid substrate~~s are~~ is transparent.

9. (Currently amended) The biochip ~~Biochip~~ according to claim 5 wherein the dielectric support is vetronite, glass or ceramic.

10. (Currently amended) The biochip ~~Biochip~~ according to claim 5 wherein the microelectrodes of the array ~~(20)~~ have a size with a surface of at least ten per cent of the total cell membrane and preferably a diameter ranging from 1 μm to 50 μm.

11. (Currently amended) The biochip ~~Biochip~~ according to claim~~s~~ 4 ~~-10~~ wherein the microelectrodes are of conductive or capacitive type.

12. (Currently amended) The microelectrodes ~~Microelectrodes~~ according to claim 11 consisting of conductive microelectrodes obtained over a silicon substrate ~~(31)~~ covered with an ~~a~~ insulating layer preferentially of SiO_2 ~~(32)~~, said microelectrodes having connecting traces wherein said microelectrodes and their connecting traces

~~(38)~~ being made by a "sandwich" of two titanium nitride, ~~(~~TiN~~)~~, layers ~~(33)~~ and an aluminium layer ~~(34)~~, covered with a gold layer ~~(37)~~ on their active surface.

13. (Currently amended) The microelectrodes ~~Microelectrodes~~ according to claim 11 wherein said microelectrodes are realized ~~realised~~ using Metal Oxide Semiconductor, ~~(~~MOS~~)~~, technology.

14. (Currently amended) The microelectrodes ~~Microelectrodes~~ according to claim 13 consisting of a silicon p-type substrate ~~(40)~~ in which two n-doped regions, a drain ~~(41)~~ and a source ~~(42)~~, are implanted with conventional microelectronic techniques, ~~the~~ a gate ~~(43)~~ of these electrodes being realized ~~realised~~ in n+ doped polysilicon and ~~is~~ common to all devices in a row, ~~(~~word line~~)~~, the drain ~~(41)~~ of all devices in a column being connected together by using a metal contact plug and a metal line ~~(44)~~, the source ~~(42)~~ of the transistor being connected via a metal, ~~(~~usually tungsten~~)~~, plug ~~(46)~~ to a gold layer ~~(47)~~ which acts as the active electrode.

15. (Currently amended) The microelectrodes ~~Microelectrodes~~ according to claim 11 consisting of a capacitive microelectrode obtained with an insulating substrate ~~(60),~~ a metal ~~(61)~~ and a thin insulating layer ~~(64)~~ said microelectrodes being separated by insulating material ~~(62)~~ and covered in non exposed areas by a passivation layer ~~(63)~~.

16. (Currently amended) A method ~~Method~~ of electroporation ~~characterised in that~~ wherein an apparatus according to claim~~s~~ 1 ~~–3~~ is used.

17. (Currently amended) The method ~~Method~~ according to claim 16 ~~characterised in that~~ wherein said apparatus performs one or more electroporations to at least a single adhering cell.

18. (Currently amended) The method ~~Method~~ according to claim 17 ~~characterised in that~~ wherein said apparatus comprises a biochip according to claim~~s~~ 4 ~~–11~~.

19. (Currently amended) The method ~~Method~~ according to claim~~s~~ 16 ~~–18 characterised~~

~~in that~~ wherein said biochip comprises microelectrodes according to claim~~s~~ 11 ~~12–15~~.

20. (Currently amended) The method ~~Method~~ according to claims 16 ~~–19 characterised in that~~ wherein the wave generator sends to the electrodes trains of pulses of various amplitude and duration.

21. (Currently amended) The method ~~Method~~ according to claim~~s~~ ~~16–~~ 20 ~~characterised in that~~ wherein the wave generator sends to the microelectrodes five trains of 25 pulses, ~~(~~1 ms duration~~)~~, repeated at a time interval of 500 ms.

22. (Currently amended) The method ~~Method~~ according to claim~~s~~ ~~16–20 characterised in that~~ wherein ~~a~~ trains of triangular voltages consisting of 10 pulses are applied to the electrodes the interval between one train and another being ~~of~~ 5 s.

23. (Currently amended) The method ~~Method~~ according to ~~any of preceding~~ claim~~s~~ 16 ~~characterised in that it~~ comprise~~s~~ing substantially the following steps:

- cultivating ~~cultivate~~ cells since the adhering stage is reached;
- adding ~~add~~ in the culture medium at least one compound to be electroporated in at least one single cell of ~~the~~ said cells;
- selecting ~~selected~~ at least one single cell and at least one microelectrode on which said selected single cell is adherent;
- generating ~~generate~~ at least one electric signal ~~suitable~~ capable to electroporate said at least one single cell with said at least one compound to be electroporated and driving ~~drive~~ said electric signal to ~~the~~ said one microelectrode on which said selected single cell is adherent.

24. (Canceled) ~~Electroporated cells characterised in that they are obtained with method according claims 16 – 23.~~

~~25.~~ (Canceled) ~~Electroporated cells according to claim 24 wherein the electroporated agents are drugs, genetic constructs and proteins.~~

26. (New) The method ~~Method~~ according to claim 23 wherein the ~~said~~ compounds to be electroporated are drugs, genetic constructs and proteins.